

1   What is claimed:

2   1.   Amphipathic polymer particles prepared by polymerizing a plurality of

3   components comprising:

4         an unsaturated monomer containing a hydrophobic moiety, and

5         an unsaturated monomer containing a convertible moiety that is hydrophobic in

6   an acidic environment and hydrophilic in a basic environment.

7   2.   The amphipathic polymer particles of claim 1, wherein the content of polymeric

8   units derived from the unsaturated monomer containing a convertible moiety is in the

9   range of 1% to 60% by weight.

10   3.   The amphipathic polymer particles of claim 1, further comprising a polymerizable

11   dye monomer.

12   4.   The amphipathic polymer particles of claim 1, further comprising a cross linker.

13   5.   The amphipathic polymer particles of claim 1, wherein the content of polymeric

14   units derived from the unsaturated monomer containing the hydrophobic moiety is in the

15   range of 30% to 99% by weight, and the content of polymeric units derived from the

16   unsaturated monomer containing the convertible moiety is in the range of 1% to 60% by

17   weight.

18   6.   A method of preparing amphipathic polymer particles comprising the steps of:

19         admixing an aqueous carrier, an unsaturated monomer containing a hydrophobic

20   moiety, an unsaturated monomer containing a convertible moiety, and a surfactant to

21   form an emulsion;

22         initiating a polymerization by adding a catalyst to the emulsion,

23         continuing polymerization at a temperature and for a period of time sufficient to

24   form amphipathic polymer particles,

25         wherein the amphipathic polymer particles have a size range of 50–500 nm.

26   7.   The method of claim 6, further comprising the step of filtering the reaction

27   mixture through a filter.

28   8.   The method of claim 6, wherein the emulsion further contains a polymerizable

29   dye monomer.

30   9.   The method of claim 6, wherein the emulsion further contains a cross linker.

31   10.   The amphipathic polymer particles produced by the method of claim 6.

32   11.   An ink composition comprising:

33         a vehicle,

34         a surfactant,

1           a pigment, and  
2           amphipathic polymer particles prepared by the method of claim 6,  
3           wherein said vehicle is water or a mixture of water and one or more humectants.  
4   12. An ink composition comprising:  
5           a vehicle,  
6           a surfactant, and  
7           amphipathic polymer particles prepared by the method of claim 8,  
8           wherein said vehicle is water or a mixture of water and one or more humectants.  
9   13. Amphipathic polymer particles prepared by polymerizing a plurality of  
10       components comprising:  
11           an unsaturated monomer containing a hydrophilic moiety, polymerized through an  
12       ATRP process, and  
13           an unsaturated monomer containing a hydrophobic moiety, polymerized in an  
14       emulsion,  
15           wherein the amphipathic polymer particles have a size range of 50-500 nm, and a  
16       polydispersity index in the range of 1-1.2.  
17   14. The amphipathic polymer particles of claim 13, further comprising a  
18       polymerizable dye moiety, polymerized through the ATRP process.  
19   15. The amphipathic polymer particles of claim 13, further comprising a cross linker  
20       polymerized in the emulsion.  
21   16. The amphipathic polymer particles of claim 13, wherein the content of the  
22       hydrophobic moiety is in the range of 30% to 99% by weight, the content of the  
23       hydrophilic moiety is in the range of 1% to 60% by weight,  
24   17. A method of preparing amphipathic polymer particles comprising the steps of:  
25           admixing an initiator having one or more radically transferable atoms or groups, a  
26       hydrophilic monomer, a ligand and a catalyst to form an ATRP mix;  
27           admixing one or more hydrophobic monomers, a surfactant, and water to form an  
28       emulsion;  
29           adding the emulsion to the ATRP mix to form the amphipathic polymer particles,  
30           wherein the amphipathic polymer particles having sizes of about 50 to about 400  
31       nm, and a polydispersity index of 1-1.2.  
32   18. The method of claim 17, further comprising the step of filtering the reaction  
33       mixture through a filter.

- 1    19.    The method of claim 17, wherein the ATRP mix further comprises a
- 2    polymerizable dye monomer.
- 3    20.    The method of claim 17, wherein the emulsion further comprises a cross linker.
- 4    21.    The amphipathic polymer particles produced by the method of claim 17.
- 5    22.    An ink composition comprising:
  - 6        a vehicle,
  - 7        a surfactant,
  - 8        a pigment, and
  - 9        amphipathic polymer particles prepared by the method of claim 17,
- 10      wherein said vehicle is water or a mixture of water and one or more humectants.
- 11     23.    An ink composition comprising:
  - 12        a vehicle,
  - 13        a surfactant, and
  - 14        amphipathic polymer particles prepared by the method of claim 19,
- 15      wherein said vehicle is water or a mixture of water and one or more humectants.